Limb Salvage Using High-Pressure Intermittent Compression Arterial Assist Device in Cases Unsuitable for Surgical Revascularization

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Arch Surg. 2001;136:1280-1285

Hypothesis: Intermittent compression therapy for patients with inoperable chronic critical ischemia with rest pain or tissue loss may have beneficial clinical and hemodynamic effects.

Study Design: Case series of 14 consecutive ischemic legs that underwent application of a 3-month treatment protocol during a 2½ year study.

Setting: Veterans Administration Hospital.

Patients: Thirteen patients with 14 critically ischemic legs (rest pain, n=14; tissue loss, n=13) who were not candidates for surgical reconstruction were treated with rapid high-pressure intermittent compression. The patients had a mean age of 76.2 years, 8 were diabetic, and they represented 10% of referrals for chronic critical ischemia. They were not amenable to revascularization owing to lack of outflow arteries (n=7), lack of autogenous vein (n=5), or poor general medical condition (n=3).

Intervention: All patients were instructed to use the arterial assist device for 4 hours a day at home for a 3-month period.

Main Outcome Measures: Limb salvage and calibrated pulse volume amplitude.

Results: After 3 months, 9 legs had a significant increase in pulse-volume amplitude ($P<.05$). These legs were salvaged, whereas the 4 amputated legs demonstrated no hemodynamic improvement. We noted a direct correlation between patient compliance and clinical outcome. Patients in whom limb salvage was achieved used their compression device for longer periods of time (mean time, 2.38 hours a day) compared with those who underwent amputation (mean time, 1,14 hours a day) ($P<.05$). These mean hours of use were derived from an hour counter built into the compression units.

Conclusions: Intermittent high-pressure compression may allow limb salvage in patients with limb-threatening ischemia who are not candidates for revascularization. Further studies are warranted to assess intermittent compression as an alternative to amputation in an increasingly older patient population.